IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

In re Patent Application of

FLAUTNER et al

Serial No. 10/687,924

Filed: October 20, 2003

Title: DATA PROCESSING SYSTEM PERFORMANCE COUNTER

Atty Dkt. SCS-550-463

C#   M#

TC/A.U.: 2181

Examiner: H. Kim

Date: June 27, 2007

JUN 27 2007

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**

☐ **NOTICE OF APPEAL**
Applicant hereby **appeals** to the Board of Patent Appeals and Interferences
from the last decision of the Examiner twice/finally rejecting $500.00 (1401)/$250.00 (2401) $
applicant's claim(s).

☒ An appeal **BRIEF** is attached in the pending appeal of the
above-identified application $500.00 (1402)/$250.00 (2402) $ 500.00

☐ Credit for fees paid in prior appeal without decision on merits   -$ (   )

☐ A reply brief is attached.   **(no fee)**

☒ Petition is hereby made to extend the current due date so as to cover the filing date of this
paper and attachment(s)   One Month Extension $120.00 (1251)/$60.00 (2251)
                     Two Month Extensions $450.00 (1252)/$225.00 (2252)
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     ☐ "Small entity" statement attached.

Less   month extension previously paid on   -$(   )

                                          TOTAL FEE ENCLOSED $ 620.00

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension.
The Commissioner is hereby authorized to charge any <u>deficiency</u>, or credit any overpayment, in the fee(s) filed, or
asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this
firm) to our **Account No. 14-1140.** A <u>duplicate</u> copy of this sheet is attached.

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NIXON & VANDERHYE P.C.
By Atty: Stanley C. Spooner, Reg. No. 27,393

Signature: _____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	Confirmation No.: 8335
FLAUTNER et al	Atty. Ref.: 550-463
Serial No. 10/687,924	Group: 2181
Filed: October 20, 2003	Examiner: H. Kim
For: DATA PROCESSING SYSTEM PERFORMANCE COUNTER	

* *

APPEAL BRIEF

On Appeal From Group Art Unit 2181

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

FLAUTNER et al   Atty. Ref.: 550-463

Serial No. 10/687,924   Group: 2181

Filed: October 20, 2003   Examiner: H. Kim

For: DATA PROCESSING SYSTEM PERFORMANCE COUNTER

* *

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APPEAL BRIEF

Sir:

I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is ARM Limited

and the University of Michigan by virtue of an assignment of rights from the

inventors to ARM Limited and the University of Michigan recorded January 6,

2005 at Reel 16137, Frame 932.

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II. RELATED APPEALS AND INTERFERENCES

There are believed to be no related appeals, interferences or judicial proceedings with respect to the present application, other than the Pre-Appeal Brief Request for Review filed June 13, 2006.

III. STATUS OF CLAIMS

Claims 1, 3-8 and 10-14 stand rejected in the Final Official Action and claims 2 and 9 have been cancelled. The Examiner contends that, with respect to claims 1, 3-8 and 10-14, the phrase "the count value" lacks antecedent basis and therefore is rejectable under 35 USC §112 (second paragraph) as being indefinite. Claims 1-14 (even though claims 2 and 9 previously have been cancelled) stand rejected under 35 USC §102 as allegedly being anticipated by Cooper (U.S. Patent 6,829,713). The above rejections of claims 1, 3-8 and 10-14 are appealed.

IV. STATUS OF AMENDMENTS

An Amendment under Rule 116 was filed on May 11, 2006 offering to amend the objected to phrase "count value," but entry of the amendment was denied in the Examiner's Advisory Action mailed May 31, 2006. Other than this Rule 116 Amendment, no further response has been submitted with respect to the Final Official Action in this application, other than the filing of a Pre-Appeal Brief

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Request for Review which was filed on May 11, 2006 and the Notice of Panel

Decision was mailed April 27, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' specification and figures provide an explanation of the claimed

invention set out in independent claims 1 and 8, with each claimed structure and

method step addressed as to its location in the specification and in the figures.

"1. Apparatus for processing data, said apparatus being operable to

perform processing work at a variable rate of work and comprising:

a performance counter [item 600 as disclosed in figure 6 and discussed on

page 17, line 29 to page 18, line 14 and elsewhere in the specification] operable to

add a work increment value [stored in increment value register 610 as disclosed in

figure 6 and discussed on page 20, lines 1-9 and elsewhere in the specification] to

an accumulated work done value [stored in work count value register 642 as

disclosed in figure 6 and discussed on page 20, lines 1-21 and elsewhere in the

specification] to accumulate a work done value indicative of an amount of

processing work performed by said apparatus; and

a clock signal generator [item 720 as disclosed in figure 7 and discussed on

page 20, lines 23 to 32 and elsewhere in the specification] operable to generate a

clock signal to drive processing operations of said apparatus [variable performance

levels correspond to variable frequency as discussed on page 20, lines 27-29 and elsewhere in the specification], said clock signal having a variable frequency, wherein said work increment value is variable so as to represent said variable rate of work [different examples of increment values calculated by software control module 620 and/or hardware control module 630 as disclosed in figure 6 as discussed on page 18, lines 5-10 and elsewhere in the specification] and said work increment value is dependent upon a clock signal frequency value [power supply control 730 inputs current processor frequency to increment value register 610 as disclosed in figure 7 and discussed on page 20, lines 27-32 and elsewhere in the specification] at or close to a time that the count value is incremented [as discussed on page 17, line 34 to page 18, line 3 and elsewhere in the specification]."

"8. A method of measuring processing work performed by an apparatus for processing data at a variable rate of work, said method comprising the steps of:

adding a work increment value to an accumulated work done value with a performance counter [item 600 as disclosed in figure 6 and discussed on page 17, line 29 to page 18, line 14 and elsewhere in the specification] to accumulate a work done value [stored in work count value register 642 as disclosed in figure 6 and discussed on page 20, lines 1-21 and elsewhere in the specification] indicative of an amount of processing work performed by said apparatus [increment value

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read from increment value register 610 and added to accumulated sum in work

count value register 642 of the accumulator module 640 as disclosed in figure 6

and discussed on page 20, lines 1-3 and elsewhere in the specification];

generating a variable frequency clock signal [item 720 as disclosed in

figure 7 and discussed on page 20, lines 23 to 32 and elsewhere in the

specification] to drive processing operations of the apparatus [variable

performance levels correspond to variable frequency as discussed on page 20,

lines 27-29 and elsewhere in the specification], and

varying said work increment value dependent upon a frequency value of

said clock signal [power supply control 730 inputs current processor frequency to

increment value register 610 as disclosed in figure 7 and discussed on page 20,

lines 27-32 and elsewhere in the specification] so as to represent said variable rate

of work [different examples of increment values calculated by software control

module 620 and/or hardware control module 630 as disclosed in figure 6 as

discussed on page 18, lines 5-10 and elsewhere in the specification] where said

frequency value is a frequency value of said clock signal at or close to a time that

the count value is incremented [as discussed on page 17, line 34 to page 18, line 3

and elsewhere in the specification]."

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 3-8 and 10-14 stand rejected under 35 USC §112 (second

paragraph) as being indefinite due to the allegation that "the count value" in

claims 1 and 8 fails to have proper antecedent basis.

Claims 1-14 [claims 2 and 9 were previously cancelled] stand rejected

under 35 USC §102(e) as being anticipated by Cooper (U.S. Patent 6,829,713).

VII. ARGUMENT

Appellants' arguments include the fact that the burden is on the Examiner

to first and foremost properly construe the language of the claims to determine

what structure and/or method steps are covered by that claim. After proper

construction of the claim language, the burden is also on the Examiner to

demonstrate where a single reference (in the case of anticipation) or a plurality of

references (in the case of an obviousness rejection) teaches each of the structures

and/or method steps recited in independent claims 1 and 8.

The Court of Appeals for the Federal Circuit has noted in the case of

Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 221 USPQ 481,

485 (Fed. Cir. 1984) that "[a]nticipation requires the presence in a single prior art

reference disclosure of each and every element of the claimed invention, arranged as

in the claim."

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A. The Examiner's rejection under 35 USC §112 (second paragraph) is unsupported in the Final Rejection

The Examiner rejects claims 1, 3-8 and 10-14 under 35 USC §112 (second paragraph) as allegedly being indefinite due to the use of the phrase "count value." The Examiner contends that, in claims 1 and 8, the phrase "the count value" has no literal antecedent basis in the claim. While there is no *in haec verba* recitation of "count value," such is not required and this contention is respectfully traversed.

Claims 1 and 8 recite "a performance counter" for "accumulating work done values" in the apparatus and method claims, respectively, and, as would be well known to those of ordinary skill in the art, such a "performance counter" would provide a "count" or a "count value." As a result, a "count value" is **inherent** in the operation of a "performance counter." Inherent components of elements recited in a claim do not require separate antecedent basis.

The Examiner's attention is directed to the Manual of Patent Examining Procedure (MPEP) which specifically states that:

> inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation 'the outer surface of said sphere' would not require an antecedent recitation that the sphere has an outer surface." (MPEP Section 2173.05(e).

In the present case, the recitation "the count value" is inherent in the recitation of "performance counter" because those of ordinary skill in the art would be well aware that such counters provide a "count value" (of what use is a

"counter" if it doesn't provide a "count value"?). The recitation of a "performance

counter" provides proper antecedent basis for the recited "count value."

It should also be noted that Appellants, in the Rule 116 Amendment which

was refused entry by the Examiner in the Advisory Action mailed May 31, 2006,

offered to amend the phrase "count value" to read --accumulated work done

value--, as this phrase has literal antecedent basis in the claim (it is the same thing

as the recited "count value" and would obviate this rejection), but entry was

refused as it allegedly raised "new issues" that would require further consideration

and/or search" (Advisory Action maled May 31, 2006). The Rule 116

amendment, while unnecessary, was offered to accommodate the Examiner's

stated concerns and provide in haec verba support for the language used. It

certainly would not raise any additional issues requiring further consideration

and/or search, but was denied by the Examiner.

Accordingly, there is no basis for rejecting claims 1 and 8 (or claims

dependent thereon) under 35 USC §112 (second paragraph) as lacking proper

antecedent basis.

B. The Appellants' claimed invention

Appellants' independent claims 1 and 8 specify an apparatus and method,

respectively, for measuring processing work accomplished by a data processor.

Prior art systems for measuring work done (such as disclosed in the cited Cooper patent (U.S. Patent 6,829,713)) use a fixed work value which is the work estimated to be done during a single clock cycle and then the fixed work value is multiplied by the clock frequency to determine the estimate of the work done.

As noted in the present specification, Appellants had found that a much more accurate estimate of actual work done is to use a non-fixed work value, i.e., "wherein said work increment value is **variable**" and thereby reflecting a variable rate of work being performed (emphasis added). Appellants' "performance counter" adds "a work increment value" to an "accumulated work done value," where the claimed clock signal generator specifically has a variable frequency. Appellants' claim also requires that there be a variable work increment value, and the work increment value is chosen based upon the clock signal frequency value "at or close to a time that the count value is incremented."

It would appear in reviewing the Final Rejection that the Examiner has simply failed to appreciate or understand the recited features of the independent claims, i.e., "wherein said work increment value is variable so as to represent said variable rate of work" and that the "work increment value is dependent upon a clock frequency value at or close to a time the count value is incremented."

C. The Rejection of claims 1-14 under §102 fails because Cooper reference fails to disclose the claimed "variable work increment value"

The Examiner finally rejects claims "1-14" [sic] (claims 2 and 9 have previously been cancelled) as being anticipated by Cooper (U.S. Patent 6,829,713). As will be seen, Cooper contains no disclosure of Applicants' claimed subject matter or method step.

Cooper utilizes the conventional and known calculation of a work done value by incrementing the value by the same fixed amount per clock cycle regardless of the clock frequency. Cooper does not even recognize that the work done by a processor operating at a frequency of "2f" is not necessarily twice the amount of work done by that processor at a frequency of "f" even though twice the number of clock cycles occur when operating at the "2f" frequency. Appellants recognized this anomaly because the performance of the processor and its associated components may be more or less than might otherwise be expected at different frequencies.

Appellants' invention, both in the apparatus claim 1 and method claim 8, solves the problem of inaccurate work assessment, in part, by requiring that the "work increment value is variable." Thus, if the processor is operating at a frequency where the work increment value is lower or higher than the work done at another frequency, it will accurately track the accumulated work done value. There is no disclosure in Cooper of a variable "work increment value."

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Not only does Appellants' claim specify that the "work increment value is variable," the claim also ties the determination of the "work increment value" to the clock signal frequency which is taken "at or close to a time that the accumulated work done value is incremented." Thus, the claim requires a variable work increment value dependent upon the clock frequency (at the time the accumulated work done value is incremented) which allows Appellants' claimed apparatus and method to much more accurately track actual work done by a processor.

Because the Examiner fails to point out where the claimed structure and method step is shown in the Cooper reference (which utilizes only a fixed value of work done per clock cycle), he cannot support any anticipation rejection of the present independent claims, or claims dependent thereon, in view of the Cooper reference. As a result, the rejection of claims 1-14 under 35 USC §102 fails

**D. The Rejection of claims 1-14 under §102 fails because
the Cooper reference would actually would lead one of
ordinary skill in the art away from the claimed invention**

Cooper not only fails to anticipate or render obvious the claimed invention, he actually would lead one of ordinary skill in the art to use "fixed" values and not appellant's claimed variable "work increment values." The lack of recognition in Cooper that the use of "fixed" values presents problems in correct work assessment is confirmation of the un-obviousness of the claimed invention.

Cooper does not recognize or provide any apparatus or method which will take into account the above anomaly of variations in work done based upon work done at different clock frequencies.

As a result, Cooper does not support any rejection of claim 1, 3-8 and 10-14 under 35 USC §102 or future rejection under 35 USC §103 and any further rejection thereunder is respectfully traversed.

VIII. CONCLUSION

In view of the above discussion, the Examiner appears to have ignored the instructions of the MPEP §2173.05(e) which instructs that "inherent components of elements recited have antecedent basis in the recitation of the components themselves." As a result, the claim's recitation of a "performance counter" inherently has a "count value" and therefore separate and specific antecedent basis for the phrase "count value" is not needed. The Examiner also appears to ignore specific limitations set out in Appellants' claim, i.e., "said work increment value is variable" and is "dependent on a clock signal frequency value at or close to a time that the count value is incremented." Finally, the Examiner appears to ignore the fact that the single cited prior art reference to Cooper utilizes the same fixed (non-variable) value for all frequencies. Therefore, neither Cooper nor the Examiner appear to recognize the problem created by the use a "fixed" value of work done
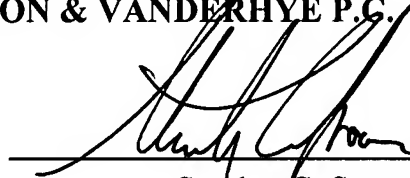
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for each clock cycle and then benefit of Appellants' invention which provides a

variable rate of work dependent upon the clock frequency.

As a result of the above, there is simply no support for the rejections of

Appellants' independent claim or claims dependent thereon under 35 USC §112 or

§102. Thus, and in view of the above, the rejection of claims 1, 3-8 and 10-14

under 35 USC §§112 and 102 (or future rejection under §103) is clearly in error

and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
Enclosure

IX. CLAIMS APPENDIX

1. (previously presented) Apparatus for processing data, said apparatus being operable to perform processing work at a variable rate of work and comprising:

a performance counter operable to add a work increment value to an accumulated work done value to accumulate a work done value indicative of an amount of processing work performed by said apparatus; and

a clock signal generator operable to generate a clock signal to drive processing operations of said apparatus, said clock signal having a variable frequency, wherein said work increment value is variable so as to represent said variable rate of work and said work increment value is dependent upon a clock signal frequency value at or close to a time that the count value is incremented.

2. (cancelled).

3. (previously presented) Apparatus as claimed in claim 1, comprising an increment value adjusting circuit operable to adjust said work increment value in dependence upon said clock signal frequency.

4. (original) Apparatus as claimed in claim 3, wherein said work increment value variable non-linearly with said clock signal frequency.

5. (previously presented) Apparatus as claimed in claim 1, comprising a variable voltage power supply operable to supply electrical power to said apparatus at a plurality of different supply voltages, said clock signal generator being operable to generate higher frequency clock signals at higher supply voltages.

6. (original) Apparatus as claimed in claim 1, wherein said work increment value is programmable under software control.

7. (original) Apparatus as claimed in claim 1, wherein said work increment value is varied with a read-modify-write operation.

8. (previously presented) A method of measuring processing work performed by an apparatus for processing data at a variable rate of work, said method comprising the steps of:

adding a work increment value to an accumulated work done value with a performance counter to accumulate a work done value indicative of an amount of processing work performed by said apparatus;

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generating a variable frequency clock signal to drive processing operations
of the apparatus, and

varying said work increment value dependent upon a frequency value of
said clock signal so as to represent said variable rate of work where said frequency
value is a frequency value of said clock signal at or close to a time that the count
value is incremented.

9. (cancelled).

10. (previously presented) A method as claimed in claim 8, comprising
adjusting said work increment value in dependence upon said clock signal
frequency.

11. (original) A method as claimed in claim 10, wherein said work
increment value variable non-linearly with said clock signal frequency.

12. (previously presented) A method as claimed in claim 8, comprising
supplying electrical power to said apparatus at a plurality of different supply
voltages and generating higher frequency clock signals at higher supply voltages.

13. (original) A method as claimed in claim 8, wherein said work increment value is programmable under software control.

14. (original) A method as claimed in claim 8, wherein said work increment value is varied with a read-modify-write operation.

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X. EVIDENCE APPENDIX

None.

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XI. RELATED PROCEEDINGS APPENDIX

None.

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